

THE

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VIGIL

Can anyone **accurately**
forecast market outcomes?

In this edition of the Vigil, we address key behavioural biases affecting investors in their decision-making process to better understand why individuals do not always act as economic and financial theoretical models predict.

First of a series

*“VIGIL: from the latin ‘Vigilare’.
Keeping awake at a time when
sleep is customary; an act of
watching; surveillance” - Merriam
Webster*



N A T C A N
INVESTMENT MANAGEMENT

«The investment universe is characterized by constant movement and change. To successfully navigate therein one must demonstrate intellectual conviction and discipline. One must be capable of reading signs on the distant horizon while avoiding shoals in the near and present. One must also show humility, realism and maintain a good dose of humor. In short we must never fail at being vigilant.

Those qualities are brought forward daily by Natcan's team of professionals. The following commentary reflects the views and opinions of our team on issues impacting Canadian investors and their advisors. »

- Pascal Duquette, president and CIO

>>> NATCAN

Founded in 1990, Natcan Investment Management Inc. is a subsidiary of the National Bank of Canada with approximately 26 billion dollars under management. Natcan is one of the premier institutional money managers in Canada. Our investment leaders follow their convictions with discipline and rigour to serve the best interests of our clients and their financial advisors.

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Prior to joining Natcan Investment Management in 2004, Pascal spent 18 years leading CN Investment's Global Equity Investment effort. He started in 1986 as equity research analyst, rose to the position of portfolio manager for European equities in 1991 and to portfolio manager for global equities in 1998. During this period, Pascal also served as a member of different equity and management investment committees overseeing overall investment strategy. Pascal obtained his Master's degree in Science (finance) from Université de Montreal in 1986, and is a holder of the right to use the Chartered Financial Analyst designation.

“As complexity rises, precise statements lose meaning and meaningful statements lose precision” - Lofti Zadeh

This statement spoke loudly to me the moment I heard it at a Harvard University seminar on behavioural finance¹. It seemed to crystallize the insurmountable difficulties financial theorists encounter when devising precise models to explain or forecasting the behaviour of financial markets. The December 2007 edition of the Vigil (available on www.natcan.com) introduced behavioural finance as an interesting avenue of research to further our understanding of the reasons why individuals do not always act as economic and financial theoretical models predict.

I readily acknowledge the single flaw of behavioural finance: it is easier to elucidate behaviours after the fact than to forecast them. However, any discipline that enables investors to better understand their behaviours has real value, even if only to ensure mistakes are not repeated ad infinitum.

Behavioural finance identifies biases that influence the investment decision-making process. Borrowing heavily from experimental psychology and recent research, these biases likely find their source in the very essence of human nature and conduct. Studies in neural science, particularly neuroeconomics, have revealed surprising results to that effect. This edition of the Vigil illustrates some of the many biases that exist, and attempts to convert obscure language into simpler terms.

BIAS #1 - OVERCONFIDENCE

What is your best estimate of the value of the Dow Jones one month from today?

In general, finance experts are not well-calibrated. Surprisingly, meteorologists and race-hack handicaps are far more successful in that regard.

Research suggests a highly systematic bias in subjective confidence intervals. Too many surprises along the way indicates intervals are

¹ The author wishes to acknowledge Daniel Kahneman and Richard Thaler, two professors who have immensely contributed to the field of behavioural finance. Many of the examples cited in these pages are inspired from a course they gave at a Harvard seminar on the subject.

set too tightly. Is this a reminder of the many failures of risk models?

BIAS #2 - ESTIMATION PROBLEM

Imagine two one-mile stretches of railroad tracks, set end to end, and attached to the ground at both extremes. Suppose it gets hot, and the track expands one inch, forcing it to rise above the ground. How high above the ground will the track rise?

When this exercise was carried out in the classroom, people were asked to provide a range of forecast without the use of a calculator. Not a single person came close to the correct answer, albeit a simple mathematical problem based on the Pythagoras theory $a^2+b^2=c^2$. Most answers approximated one inch, while the correct answer was 29 feet 6 inches!

This example shows that believing in our ability to guess a result without proper calculation is yet another form of overconfidence. This behaviour will most often lead to greater estimation errors.

BIAS #3 - OPTIMISM

How good a driver are you? Compared to the drivers you encounter on the road, are you above average, average or below average?

Optimists tend to exaggerate their talents. This explains why 80% of drivers consider themselves to have above-average driving skills, a proportion that is clearly not reflective of our reality.

Moreover, optimists tend to underestimate the likelihood of a bad outcome in situations they do not control. To illustrate, a study found most undergraduates believe they are less likely to develop cancer than their roommates.

The combination of overconfidence and optimism is a toxic one, causing individuals to overestimate their knowledge and ability to control events, and underestimate risk, thus increasing vulnerability to statistical surprises.

BIAS #4 - HINDSIGHT

A group of students were asked on the first day of school to estimate the probability of certain events occurring between February 1 and April 1 of the following year. At the end of the school year, students were asked to recall the probabilities assigned to each event.

The data are found below:

	Old probability	New probability	Students who remembered the event (%)
There will be a 10cm snowstorm in Ithaca	54	49	21
The temperature in Ithaca will fall below 10°F	56	49	36
The temperature will rise above 70°F	19	35	94
The Dow Jones will rise above 1600	37	61	93
The Dow Jones will fall below 1500	49	36	11

The results suggest the assessment of probabilities is very much influenced by the percentage of people who recall the event. Expert recollection of probability is higher if the event occurred, and lower if it did not.

Hindsight errors are harmful in two ways. Firstly, hindsight tends to foster overconfidence, thus creating an unrealistic perception the world is more predictable than it is. Secondly, hindsight turns reasonable gambles into foolish mistakes.

In finance terms, once a stock has dropped in value, its fall appears to have been inevitable.

BIAS #5 - LOSS AVERSION, NOT RISK AVERSION

You are challenged to bet on the toss of a coin. If you're wrong, you lose \$100. What is the minimal gain that would make this gamble acceptable?

With a 50/50 probability of winning, the answer should be \$100.

When played in large numbers, the answer tends to fall between \$200 and \$250, thus reflecting the sharp asymmetry called loss aversion, i.e., the value people assign to potential losses is bigger than the one assigned to potential gains.

BIAS #6 - ANCHORING

In the following "before or after" problem, the anchor (target date) is randomly chosen for each person.


Take the last three digits of your social security number and add 400. Insert the result here: ____ (anchor).

The Huns under Attila invaded Europe and penetrated deep into what is now France, where they were defeated and forced to return eastward. In what year did Attila's defeat occur? Answer: _____.

Clearly, the results of the two questions share no link of cause (measured by correlation). However, according to a report by Professor Thaler, they do. Below are the results of a test he reported on.

Anchor	# of respondents	Answers to Attila's defeat	Correct answer
400-599	13	626	451 AD
600-799	14	660	
800-999	18	789	
1000-1199	18	865	
1200-1399	15	988	

Answers to the question about the date of Attila's defeat are clearly linked to the last three digits of the social security number+400.



This helps demonstrate that people will tend to use any number to frame an answer, even if no obvious relationship exists between the questions.

BIAS #7 - ORDERING OF QUESTIONS OR THE DATING HEURISTIC

People are asked to answer yes or no to the following two questions:

- 1) How happy are you?
- 2) Are you dating?

First the questions are asked in order and then in reverse.

Answers should be the same regardless of the order of questioning. This is however not the case in application. When the happiness question is asked first, correlation with the answer is only 0.12 but when asked in reverse, it rises to 0.66.

This is a combination of framing and anchoring, as people tend to use prior information to shape their answers to subsequent questions.

BIAS #8 - CONFIRMATION BIAS OF OVERREACTION TO CHANCE EVENTS

Which of the following sequences is more likely to occur when a coin is tossed?

HHH TTT or HTH TTH?

H(head) - T(ails)

Most people inaccurately believe that the latter sequence is more likely to occur because it appears more random. However, the two are correct, and equally likely to occur.

Individuals are too quick to perceive casual regularity in a random sequence of events. This theory is known as the hot-hand fallacy². Recent neuroeconomics studies show that only two occurrences of a repeated event are needed to create the appearance of a series of non-random events. Our minds seek to confirm in data and information what is desired by sight and belief. Looking for order in chaos is reassurance of our control over situations.

² Based on a Tversky and Glovich study of basketball players' shooting results (1989)

In psychology, it is said that perception is a function of expectation. Consultants are hired to give advice, and should always be asked to prove the opposite outcome of what is desired. If a consultant offers a convincing explanation, added value is assured.

CONCLUSION

Johan Maynard Keyes once said, "The stock market is like a beauty contest. To identify the winner, it is not important to choose the best looking contestant, but who the judge will pick as the best looking contestant".

Recently, the Financial Times held a contest to win two business class tickets New-York-London. Each player had to submit a number between 0 and 100.

Call the submission x_i . Compute the average of x_i , and call this M . The winner is the person whose guess is closest to two-thirds of M .

Out of 1468 entries, the results were $M=18.91$ and $2/3 M = 12.6$. Thirty-one entries guessed 13.

The game analysis is fairly logical. Some players have no idea what to do as they figure this is a guess, so they guess 50. Another category of players deem that most of the other players are surely asleep and will guess 50, so they guess 33 (2/3 of 50). The following category of players are confident that most of the other players think they are pretty smart and figure everyone else is asleep by guessing 33, so they guess 22 (2/3 of 33). And so on to the ultimate right answer, which tends to zero.

The winning number was 12.6, illustrating that your reasoning must be in line with that of the crowd to win. Advanced reasoning will prove to be as wrong as simplistic reasoning.

Applied to finance, this means you have to think like the average investor to be right, at least in the short term. Benjamin Graham once said, "In the short run, the market is a voting machine, but in the long run it is a weighing machine."



Complex reasoning should prove right in the long term if conditions don't change and if you stay in power to maintain the trade. As Keynes said, markets can remain irrational longer than people can remain solvent.

With over 20 years in the finance industry, I have seen these - and several other - biases at play regularly. I can also say that I myself have fallen prey to these biases in the past as they are the product of our being and intellectual construct. I cannot stress enough the need for investors to be aware of their own biases as well as their peers' if they wish to successfully navigate through equity markets, rise above the competition, and always remain a step ahead of the flock.

The next edition of the Vigil will examine other biases that may influence and impair investors' decision-making process.

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